The Role of the Occupational Therapist with Children with Low Vision Part 3

by Clare Hubbard

The role of the Occupational Therapist (OT) in the multidisciplinary team to identify, prescribe and train learners with Visual Impairment in the use of assistive devices and assistive technology for school-going age children.

Background

The author has outlined the right of all visually impaired learners, to have full access to adapted visual learning information (pictures, printed texts/visual materials) and basic accommodations in the classroom to ensure their early cognitive, motor and social development. (Hubbard, 2022). The focus of the previous articles included the principles of low vision and of accommodations and universal design for learning (UDL) for children with visual impairment in the classroom and in examinations.

The focus of this article will be on the role of the occupational therapist (OT) in assistive devices and technology in this domain. The scope of practice and key intervention strategies of OTs include the identification of "unmet" needs and issuing of assistive devices in all occupational areas such as Activities of Daily Living (ADL), play, learning and productivity.

Occupational therapists need to understand the unique presentations of each visually impaired learner's visual functions and the functional implication thereof.

Whether providing these services to learners in public, ordinary or independent schools, or through private practice, the OT will form part of the School based support team (SBST) to ensure the effectiveness and utilisation and effectiveness of assistive devices in the child's home, recreational and school settings.

Introduction: Visual impairments

Persons with visual impairment have unique clinical presentations across the visual functions as assessed by an Ophthalmologist or Optometrist/Low Vision Specialist, including visual acuity, visual fields, stereopsis (depth perception), colour vision, contrast sensitivity and cortical visual functions. Commonly the World Health Organisation's (WHO) definition of visual impairment is used to outline the large range of visual impairment from being blind to partially sighted, and how to classify a person as partially-sighted (low vision) based on Snellen meters and LogMAR CF, count fingers (WHO, 2021).

Definitions of assistive technology and devices

Assistive technology (AT) is an umbrella term which includes assistive devices (AD), as defined by the WHO (2018), is a subset of health technology that "refers to assistive products and related systems and services, developed for people to maintain or improve functioning and thereby promote well-being, such as eyeglasses, hearing aids and wheelchairs". Assistive technology, which includes daily living aids, maintain or improve an individual's functioning and independence, thereby promoting their wellbeing.

In the WHO African Region, millions of people are deprived of their basic rights such as access to education and the right to work, due to the unmet need for assistive technology (de Ǿderud, 2009). The current coverage of assistive products is not proportional to the prevalence of disability types. The report identified other challenges viz. shortage of skilled healthcare professions to provide AT services, fragmented and unco-ordinated provision of services, absence of standards for assistive technology service delivery and lack of guidelines for prescription which leads to discrepancies and disparities of service quality.

The World Report on Vision (2019) and the WHO Regional report on Assistive Technology (2021), both highlight poor co-ordination of services, inadequate human resources and poor staff competencies as critical to improving services to persons with disabilities in low and middle-income countries. Samuels, Stemela and Booi (2020), identify the disjuncture between the policies of the Departments of Health and Education and the impact on a child during transition between sectors. Clearly there are severe challenges in provision of AT, which is exacerbated by poor intersectoral collaboration, and limited public-private partnerships.

Challenges to obtaining appropriate assistive devices

The South African private and public healthcare systems make provision of assistive devices and technology for persons with disabilities, based on the fundamental rights of children as per the United Nations Convention on the Rights of Persons with Disabilities and the South African Constitution. In 2018, the World

Health Assembly adopted resolution WHA71.8 on improving access to quality assistive technology at an affordable cost, strengthening nations' efforts and international co-operation.

In South Africa, the Department of Health published the Guidelines for the Provision of Assistive Devices (DOH, 2005) which serves as the best-practice for provision of assistive devices to persons with different disabilities in key areas viz. hearing (hearing aids/cochlear implants); vision (spectacles, optics, white canes), physical disability with mobility difficulties (wheelchairs, posture devices, standing devices, crutches, walking aids etc.) and speech and communications disorders (Augmentative and Alternative communication devices).

Procurement processes in public health are subject to the Public Finance Management Act regulation. Research indicates that provincial healthcare departments, who are meant to establish the need and purchase of appropriate AD within the public sector, suffer from a lack of prioritisation, leading to inadequate allocation of resources (Molekoa, Ubisi, & Sefotho, 2021). The recent transversal tender for RT275-2020 Supply and Delivery of Speech Therapy, Assistive Devices and Accessories to the State National Treasury Tender (http://www.treasury.gov.za/divisions/ocpo/ostb/contracts/default.aspx), offers an improved process for procurement of AD devices. Use of a transversal tender promotes an approach to prescriptions for individual learners as opposed to bulk buying.

Its success depends on the promulgation and use of this transversal tender, improving product knowledge from multi-suppliers, and a strategy to increase capacitation of healthcare professionals in the identification and prescription of AD for individuals.

The Department of Basic Education (DBE) also has an obligation to provide AT in schools to ensure that learners have full access to the curriculum and learning, whether in mainstream or special schools. The DBE Guidelines for Resourcing an Inclusive System (March, 2018), outline a range of disability domains and appropriate AT (Annexure A). The Department has initiated support of learners with respect to Internet Communications Technology (ITC) and assistive technology, through provincial policies and national projects to improve connectivity and assistive technology in all schools through the Department of Telecommunications and Postal Services and Independent Communications Authority of South Africa (ICASA). (https://pmg.org.za/committee-meeting/30052/).

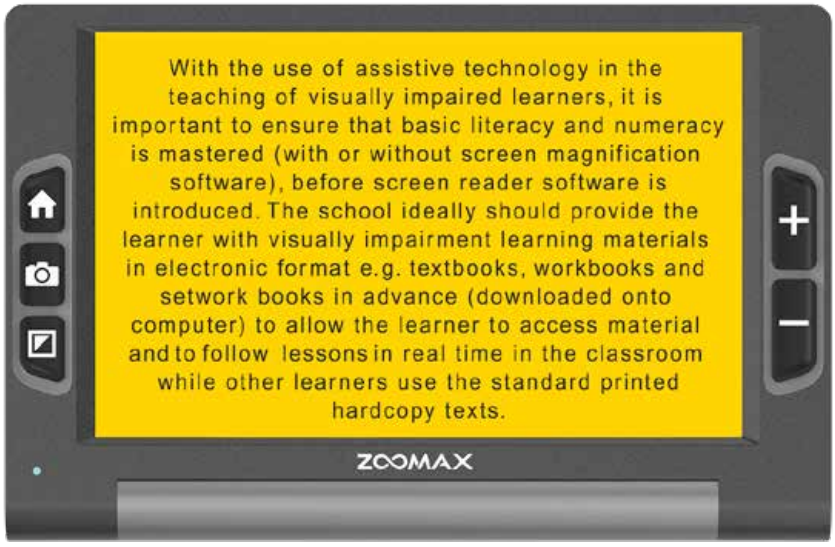
Medical Aid Schemes in South Africa make provision for provision of medical devices (most are medical and surgical devices, hearing aids, spectacles and external assistive devices related to mobility and self-care). The registration for such devices is governed by the Medicines and Related Substances Control Act No. 101 of 1965, regulated by the South African Medical Products Regulation Authority (SAPRA).

Specialised optics and assistive devices relating to visual impairment (magnifiers, specialised software or assistive technology and aids for daily living) are not offered on Medical Aid Schemes. These ADs must be strongly motivated by the healthcare professional, and are considered on a case-by-case basis or through ex-gratia application (Histed, W., personal communication, Nov 2022).

There are non-governmental and disability organisations providing low-vision assessment, who with limited funds and sponsorship, are able to provide assistive devices at no or low-cost to clients e.g., Nkosinathi Foundation, Cape Town Society for the Blind etc. In the Higher Education sector, provision is made for ADs for disabled students accessing Nesfas. The South African Disability Development Trust provides assistive devices to employed disabled persons, on an application basis (www.saddt.org.za).

Assistive Devices and Technology for Visually Impaired learners

Alongside the advances in technology in the education sector, the use of technology such as computers, laptops and tablets by learners to access print material in electronic formats by visually impaired children, has yet to become standard, inclusive practice. The slowness and reluctance to embrace AT in mainstream teaching has been well-documented and often results in learners not being provided the technological support to access learning (Corn et al., 2003; Smith et al., 2004; McLinden et al., 2016).



Compared with print enlargement, AT may have the additional advantage of providing learners with greater independence of access to printed material (Corn 2002). Research revealed that adults with visual impairment who use assistive technology and have digital skills, are more likely to access tertiary education and to be employed (Douglas, Coraran & Pavey, 2007).

Many visually impaired children will benefit from learning mobility skills, and a variety of white canes and assistive devices for daily living skills are available in South Africa.

The role of the Orientation and Mobility practitioner should be acknowledged and utilised as part of the rehabilitation team.

Models for Assessment of Assistive Technology and Devices prescribed by Occupational Therapists

The research shows that there is a lack of reliable models and instruments for the selection process of AT (Akure, 2017; Bernd, Van Der Pijl & De Witte, 2009). There is, however, support for the use of the Matching Person and Technology Mode developed by Scherer (2004) and the International Classification of Function (ICF) framework (Douglas, Corcoran & Pavey, 2007).

Occupational therapists have the core skills to provide such assessments using existing occupation-focused models. The Person-Environment-Occupation (PEO) model (Law et al., 1993), allows the OT to address the personal factors (the limitation or disability resulting from the impairment), the occupational performance within a context of his/her environment and the occupation itself, which changes over the lifespan of a person. A Maturity Model on School Accessibility for Visually Impaired Learners proposed by Coetser (2023), allows for the holistic assessment of multiple aspects which limit full participation of a visually impaired child in school and social/community life, and may assist schools to provide the most pertinent accommodations in line with less-resourced contexts.

Specialised education support from Department of Education to learners with visual impairment

The impact of the Left in the Dark Report (Fish-Hodgson & Khumalo, 2015), and the subsequent litigation against South Africa's DBE, is significant for learners with visual impairment. The outcome implies that every learner with visual impairment in any public ordinary school or special school, must be provided accessible learning and teaching material (LTSM) (in an adapted format most suited to the learners), which includes assistive technology and devices, through school, district, provincial or national budgets.

Assistive Technology Services for learners with Visual impairment with the Education Sector

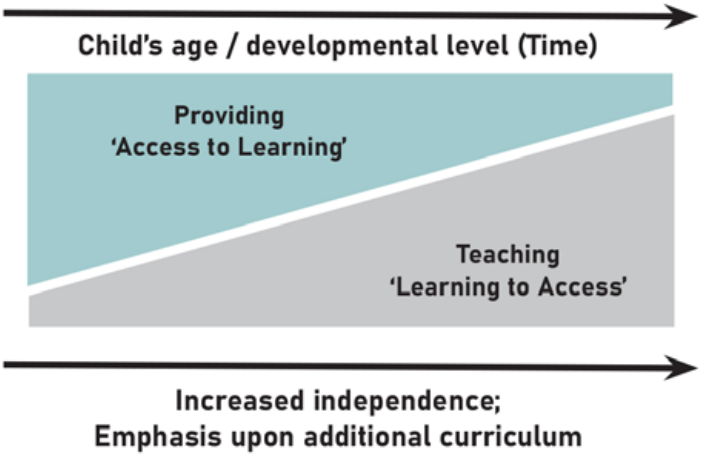
Some healthcare professions working in this domain have the ability to prescribe or recommend certain assistive technology within their professional scope of practice viz. optometrists/low vision specialists, OTs, speech-language therapists and Orientation and Mobility (O&M) practitioners. Assistive technology services, including specialist expertise and product knowledge, resides at Special Schools for Visually Impaired learners, which serve as a Resource Centres to the community (including mainstream and independent schools) for learners with visual impairment. The multi-disciplinary team providing AT services within the education sector include OTs, O&M practitioners, specialist educators, teacher assistants, Braille technicians and Information Communications Technology (ICT) Technicians at Special Schools for Visually Impaired.

Often low-vision specialists from non-governmental organisations and disabled persons organisations, can form part of the school-based support team (SBST) to provide assistive technology services. AT teams understand the classifications and types of assistive devices and develop robust product knowledge of products supplied from suppliers. The healthcare professionals in the team must be mindful of the ethical issues when collaborating with suppliers/manufacturers, to maintain professional integrity.

Assistive technology in the context of Special and Mainstream Schools supporting VI learners

The ICT Technician and specialist educators within the school, play an important role in ensuring that AT is used to support access to learning materials and for the child to learn educational technology to support learning of the specialised technology provided (Mc Linden, Douglas & Cobb, 2016).

Figure 1: Graphic representation of the balance of Providing "access to learning" and "Teaching learning to access"



Learning to access technology is developmental and requires the school to teach generalised digital skills as well as assistive technology specific to their needs e.g. specific screen reader, screen magnification, refreshable braille device, specific Optical Character Recognition (OCR) software, refreshable braille or software for desktop, laptop or mobile solution, including braille translation software and embossing devices. Learners with visual impairment need to be introduced to use of a laptop as early as Senior Phase, using keyboard shortcuts, in order to produce their work in print.

Classification of Assistive Technology

In the literature, there are different ways of classification of assistive devices and technology for visual impairment.

LOW TECH: cards in large print, labelling systems, specialised stationery (widelined paper, bold or raised line paper, bold pens), transparent coloured sheets, writing guides, book stands, handheld magnifiers, sheet magnifiers, recording devices, tactile heat machines and swell paper, Braille paper, battery operated talking or large display calculators, battery operated recording devices, light boxes etc.	**HIGH TECHNOLOGY:** special purpose computers, laptops and Smartphones, electronic Braille displays, electronic Braille notetakers, digital recording devices, digital magnifiers with extended features e.g. speech output, near and distance viewing, portable or desktop magnifier/scanners with optical character recognition (OCR) etc.
Computer hardware and peripherals: mounting systems, headphones, OCI scanners, embossers, special keys, keyboards, and pointing devices, optical mouse, Bluetooth devices	**Computer software and applications:** screen readers and screen magnification software, braille translations software, tactile and Maths MXL software; specialised applications for Smartphones and tablets.

Table 1: Classification of Assistive Technology

Another way of classifying assistive technology and devices is as follows:

- Non-optical low vision aids or low-tech assistive devices e.g. thick-tipped pens, reading-stands, bold-lined paper, wide-lined paper. These also include accommodations to the classroom environment or print such as improved contrast and lighting (Thomas et al, 2015). (www.teachingvisuallyimpaired.com/non-optical-low-visiondevices.html)
- Optical low vision aids (may be low tech or high tech)
  - Low tech magnifiers e.g. hand-held magnifier, stand-held magnifier, writing guides etc.
  - Optical devices are monocular and telescopic devices (usually prescribed by Optometrists).
  - Electronic magnifiers; digital magnifiers with extended features e.g. speech output, near and distance viewing, portable or desktop magnifier/scanners with OCD (http://www.visionaware.org/info/overview-of-low-vision-devices/low-vision-opticaldevices/45)

Classification of Assistive Technology for VI learners

Guidelines to Schools for the use of Assistive devices and technology for VI Learners

The Assistive Technology Service is part of the SBST and is a multi-disciplinary team that is reliant on the medical/visual acuity intervention which informs all aspects of the process of providing AT. The medical recommendations from an Optometrist for magnification, contrast, light sensitivity and stereopsis is critical to the process of assessments and identification of the most appropriate AT for an individual. The Optometrist indicates magnification strength (log MAR) and/or font size, as well as the contrast sensitivity required in printed text for optimal learning (Markowitz, 2016).

This information informs the selection of a specific low vision AD. The Assistive Technology Service needs to use or develop an assessment process, which considers the needs of the learner, the learners' visual functioning and the tasks required to ensure that the most appropriate prescription for assistive devices and technology is achieved.

The Case Study that follows is an illustrated tabular view with details of the assessment of occupational areas, tasks and activities, and consideration of all the gathered information and variables, and finally a critique of available products is made. (See Table 2).

Case study of a 10-year old learner with severe visual impairment in Mnqanduli Full-service School in rural Eastern Cape. Her mother and class teacher are present during the AT assessment and she has the opportunity to trial a 12 inch Android tablet (with accessibility features).

Table 2: Tabular Assessment process with use of case study

Occupational Areas	Why tasks/activities are required? (This may change/differ depending on variables - age of learner, visual function and school context)	What are the alternative AT products to consider? (write a broad requirement without identifying a product yet)	Product options - Consider the advantages and disadvantages of products
Accessing printed information	For learning to read and write, annotating notes, studying, etc.	Case study: Grade 4 learner with severe low vision may need a hand-held electronic magnifier that enlarges to 4 x (40logMAR) for daily reading and use of workbooks in class. School cannot afford to purchase all large print books as done in Grades 1-3*. Schools need to adapt test/exam materials into large print (24 font size Arial) and obtain LTSM (maths manipulatives for geometry and measurements. Formal exam accommodations must be applied for Grade 4. (enlarged font to 24 and 50% additional time)	ZoomMax M5 HD Plus 8 electronic magnifier or Zoom Max Luna 8 Approx. R14 000 (supplier on RT275 _2020 Tender sensory solutions)
Accessing print in the environment at a distance	Incidental reading of signs/posters/learning material; reading of blackboard or whiteboard	The electronic magnifier must be able to take photos so leaner can bring back to desk to read; must be robust and have a handstrap. Classroom accommodation - learner must sit in front of class and be permitted to approach whenever needed.	See above - can take photos and these can be saved on device. Can connect to a monitor or TV
Accessing electronic information	For learning to read and write, annotating, notes, studying, etc.	Ideal time to introduce a 12-inch Android tablet for reading of digital textbooks. Can use zoom function and other accessibility features (e.g. contrast) on Android tablet. Learner does not need magnification software or voice-over (text-to-speech) as demand on reading is not very high yet.	Electronic magnifier has USB port for navigation of electronic materials. 12 inch Android tablet (accessability features set up). Don't need voice-to-text features.
Performing written work (written or typed) for classwork and exams	Classwork/tests, making notes, graphs, diagrams, etc.	For written work bold and wide-spaced lined exercise book required. HB 3 pencil drawing strategies; start to use Android tablet with on-screen keyboard for making notes. Need a robust carry case for protection. (Plan for a laptop and screen magnifier software by Grade 7)	Android tablet has touch screen and on-screen keyboard to learn beginner typing skills. Need to specify carry-case.
Accessing mobile navigational information to assit in learning	- searching digitally on search engines	Will need to be taught how to save files and retrieve them on android tablet. No need for email. May be introduced to search skills on internet by school for project work. Family have poor data connectivity (live in Eastern Cape) School to provide ICT lessons. (Word and Excel) and how to search Google images for projects	
Participating in leisure, social & recreational activites	Games, reading for pleasure (Bookshare) digital media, emails, etc.	Assist family to apply to south African Library for Blind for large print and audible story books on a recorder as she enjoys books but gets visual fatigue. School needs adapted games for class. e.g Uno.	Application forms and use of MiniLib in Mthatha.
Maintaining personal, study and health records	Banking, registering online, applying to studies, etc.	Learner needs to learn how to handle money to assist mother with shopping after school. School to arrange O&M visit	
Personal mobility and transportation	Navigating playground/ community. using public transport, etc.	School needs to install white banister rail and paint grid lines on unven cement in playground. Safe community mobility but arrange assessment with O&M.	

The assessment process takes into consideration the product specifications (features, hardware, software etc.) to determine if these will enable the learner to accomplish the desired tasks. The process must also plan for teaching the learner the necessary ICT knowledge and skills to successfully use the assistive technology to accomplish the desired tasks. Finally a "prescription" (with one or two alternatives) is made and the team sets up a trial of the AT before procuring the final assistive device/s for the learner.

The prescription of AT also takes consideration if the learner is likely to experience significant sight loss in the future. The assessor/s need to select AT carefully, or to plan a staged approach to enable the learner's future needs to be met. As a learners' digital skills improve and as the volume of schoolwork increases, the future AT required should be anticipated as the case study illustrates.

Other key considerations in the Assistive Technology process are:

- Involvement of the learner's parents and educators and training in the AT is critical and reduces abandonment (or failure) of prescribed assistive devices (Riemer-Reiss & Wacker, 2000).
- Regular review with the learner, family/caregiver, the educator and possibly the ITC technician needs to be planned to ensure the outcome of provision of the AT, to review change and to deliver the skills needed to access learning with the AT.
- The management of assistive devices/technology requires a co-ordinated approach to ordering, maintaining, distributing and repairing of devices in the school, including policies for issue, replacement, safekeeping, prevention of theft and breakages (Layton, Murphy & Bell, 2018). There are no guidelines for the lifespan of AT. Training on care of the AT and devices should be provided, including software updates.

The importance of assistive technology in the classroom for learners with visual impairment

Computers and assistive technology have become ubiquitous in the education of visually impaired learners in many countries (Mc Linden, Douglas & Cobb, 2016).

While technology may offer many benefits including access to information and a route into employment (Molekoa et al., 2021), there is still resistance and many educators seem to not see the relevance of ICT.

Using technology such as computers, laptops and tablets to access print material in electronic format and with use of assistive technology and software, the learner can access enlarged adapted print without relying on others (parent/teachers/peers) to provide the material for them (Douglas et al., 2011). Use of a laptop/computer and assistive devices are commonly required by learners who are visually impaired, in the classroom and for tests and examinations and each device must be identified and individually specified e.g., hand-held magnifiers, high visibility calculators, earphones, as well as with specialised software on computers, and/or high-visibility keyboard.

Magnifiers - commonly prescribed assistive devices for visually impaired learners:

Typically a low vision/assistive device which is prescribed for the learner's visual needs is a hand-held dome or sheet magnifier to magnify printed visual material. An electronic magnifier is another alternative for use with printed visual material. The advantage is that most models allow for the learner to adjust the magnification, contrast and illumination and take a photograph of the board at distance vision, to examine at their desk. It is important to have a good understanding of the features of each product.

Specification of Zoomax Luna 8 (www.zoomax.com)

- Magnification: 2.5X - 19X
- Color modes: full color and 10 high contrast color modes
- Screen: 8-inch HD screen; screen resolution: 1280 x 800
- Camera: auto focus; 13MP
- Dimensions: 218 x 143 x 11mm (8.6 x 5.6 x 0.4 in)
- Battery life: more than 4.5 hours continuous use
- Charging time: less than 3 hours
- Transfer files with PC with supplied USB cable.
- Use supplied HDMI cable to connect Luna 8 to an HDMI TV or monitor.
- Power adapter: Input: 100-240V; Output: 5V/3A
- Has a stand and carrycase.

Figure 3: Electronic magnifier : Zoomax Luna 8

1. Home. 2. Freeze 3. Mode 4. Power indicator 5. HDMI out 6. Zoom in 7. Zoom out 8. Power button

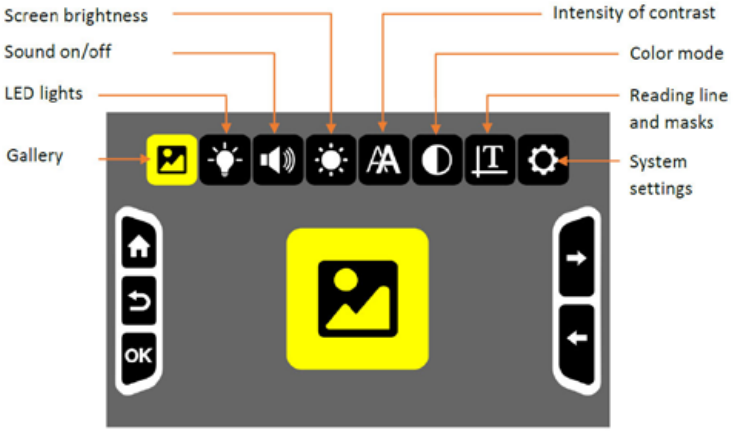


Figure 4 : Features of the Zoomax Luna 8

Commonly used AT for VI learners – Screen readers and Screen magnifiers

With the use of assistive technology in the teaching of visually impaired learners, it is important to ensure that basic literacy and numeracy is mastered (with or without screen magnification software), before screen reader software is introduced. The school ideally should provide the learner with visual impairment learning materials in electronic format e.g. textbooks, workbooks and setwork books in advance (downloaded onto computer), to allow the learner to access material and to follow lessons in real time in the classroom while other learners use the standard printed hardcopy texts.

Software for screen reading is essentially a voice-over function of printed text (text-to-speech) and is used in all computer applications and includes talk-back applications on Smartphones. Ideally screen reading software (voice-over or talk back technology) should be introduced to visually impaired learners in senior phase or Further Education (FET) band when the curriculum demands reading of large quantities of printed text.

This software is used on a laptop in the classroom with noise-reduction headphones so as not to disturb other learners. The learner listens to texts (often in double time) that they have downloaded from the internet, from email or stored on USB.

The use of a laptop with screen magnification software may be preferable to some learners with moderate to severe visual impairment, as the standard accessibility features of a computer operating system may be inadequate in terms of magnification/zoom function, enlarged icons and font and other accessibility features.

The advantage of specialised magnification software screen-magnification software such as Zoomtext (https://www.freedomscientific.com/products/software/zoomtext/), is that it allows the user to magnify the text or pictures with no distortion or pixelation of visual information when used. There are clear indications when screen-reading software should be used viz.to prevent visual fatigue when the reading quantity is excessive.

Technology in the classroom that includes Visually Impaired learners

Increasingly schools and educators are using technology in classroom and online learning, using PowerPoint presentations cast to a screen or interactive white or SMARTboards and online platforms. Screen Sharing allows the learner to view anything that is being presented using the educator's computer, that allows the VI learner to use a separate device connected to the SMARTBoard computer to follow the activity. The use of a video splitter sends the video signal to both devices. Screen sharing apps like Join.Me is another way for learners to access information on their device. https://www.teachingvisuallyimpaired.com/uploads/1/4/1/2/14122361/directions_for_ using_the_join_me_app.pdf

The principles of universal design should always be used in design as part of inclusive practice using AT in the classroom (Corn & Wall, 2002). Educators and schools creating learning materials and online platform designers should use the principles of UDL to ensure leaners with VI are not excluded. https://www.perkins.org/resource/how-write-alt-text-and-image-descriptions-visuallyimpaired/

UDL for use with screen readers

- Use alt text

Alt text tells people what is in an image, such as text or basic essential details. If an image fails to load, alt text will display in its place. Search engines also index alt text information and consider it a factor when determining search engine ratings.

- For photographs and pictures use JPG
- For logos and simple illustrations use PNG

New developments for print-disabled persons

The Constitutional Court's historic judgment in 2022 declared the Copyright Act of 1978 as unconstitutional for limiting access to reading materials in accessible formats for persons who are visually impaired. (https://blindsa.org.za/2022/09/21/constitutionalcourt-judgment-on-copyright-act-a-momentous-victory-for-persons-who-are-blindand-their-access-to-books) This is a significant breakthrough to persons with visual impairment in South Africa.

The lifting of copyright will allow for more imports and exports of accessible versions of books and other copyrighted works, without copyright holder permission, as well as formats for 3-D printing and tactile materials for leaners with visual impairment.

Conclusion

The prime barrier faced by children with mild to severe visual impairment is the limited or restricted access to visual information and learning material in a format suited to their needs. The Assistive Technology Service

is a multi-disciplinary team that uses a vigorous assessment process which allows for analysis of the information gathered and prescription of specific AT and devices. Ideally the team should allow for a trial period with loaned devices and instruction on the AT is necessary for the learner to have the greatest opportunity to achieve their stated goals. The utilisation of AT for a learner is to enhance access to teaching and learning materials and is used as part of a comprehensive specialist service with other accommodations and services, as the case study illustrates.

The identification and prescription of appropriate assistive devices and technology forms part of continuous specialised educational support for the learner to succeed in their development and education, and to exit the basic education system with increased chance of employability. The OT has a pivotal role to play as part of the healthcare team, the SBST and Assistive Technology Service, for the assessment and rehabilitation of children with low vision and to ensure that learners have full access to learning and the curriculum, as well as examinations. Further research is needed to measure functional outcomes with the use of AT in this domain, such as reading performance, as well as the impact of assistive technologies on independent learning, classroom participation and quality of life.

REFERENCES

1. Akure, Gokcen & Kars, Sinem & Çelik, Zeynep & Koç, Ceren & Arslan, Özge. (2017).
2. Assistive Technology in Occupational Therapy. Chapter 8, in Occupational Therapy - Occupation Focused Holistic Practice in Rehabilitation 10.5772/intechopen.68471. [accessed July 26, 2022]
3. de AH, Øderud T. Assistive technology in low-income countries. In: MacLachlan M, Swartz L, editors. (2009) Disability & international development: towards inclusive global health. New York: Springer.
4. Bernd, T., Van Der Pijl, D., & De Witte, L. P. (2009). Existing models and instruments for the selection of assistive technology in rehabilitation practice. Scandinavian Journal of Occupational Therapy, 16(3), 146-158.
5. Coetser, K. (2023). The School Accessibility for Learners with Visual Impairment and Blindness: A Maturity Model
6. Corn, A. L., Bell, J. K., Andersen, E., Bachofer, C., Jose, R. T., & Perez, A. M. (2003). Providing Access to the Visual Environment: A Model of Low Vision Services for Children. Journal of Visual Impairment & Blindness, 97(5), 261–272. https://doi.org/10.1177/0145482X0309700502
7. Corn, A. L., Wall, R. S. (2002). Access to multimedia presentations for students with visual impairments. Journal of Visual Impairment & Blindness, 96, 197–211.
8. Department of Basic Education. (2014). The Policy on Screening, Identification, Assessment and Support (SIAS). Pretoria: Department of Education. https://wcedonline.westerncape.gov.za/Specialised-ed/documents/SIAS-2014.pdf [accessed July 15, 2022]
9. Department of Basic Education. (2018). Draft Guidelines for the Resourcing of an Inclusive Education System. Pretoria: Department of Education. March 2018.
10. Annexure A: Assistive devices for Reasonable Accommodation. https://msmonline.co.za/wp-content/uploads/2021/04/18-Guidelines-for-Resourcingan-Inclusive-Education.pdf
11. Department of Health. (2006). Standardisation of provision of assistive devices. A guideline for use in the public sector. Republic of South Africa; Department of health; 2006
12. Douglas G, Corcoran C, Pavey S. (2007). The role of the WHO ICF as a framework to interpret barriers and to inclusion: visually impaired people's views and experiences of personal computers. British Journal of Visual Impairment. 2007;25(1):32-50. doi:10.1177/0264619607071773
13. Douglas G., McLinden, M., McCall, S., Pavey, S., Ware, J & Farrell, A.M. (2011) Access to print literacy for children and young people with visual impairment: findings from a review of literature, European Journal of Special Needs Education, 26:1, 25- 38, DOI: 10.1080/08856257.2011.543543
14. Fish-Hodgson, T. & Khumalo, S. (2015). Left in the Dark : Failure to provide access to quality education to blind and partially sighted learners, SECTION 27. In collaboration with the South African Braille Authority, the South African National Council for the Blind and Blind SA, https://section27.org.za/wpcontent/uploads/2016/07/S27-left-in-the-dark-2015-accessible.pdf [accessed July 22, 2022].
15. Hubbard, C. (2022) The Role of the OT with children with low vision (Part 2). Focus. Vol 3. December 2022.

Law M, Cooper B, Strong S, Stewart D, Rigby P, Letts L. (1996). The personenvironment-occupation model: A transactive approach to occupational performance. Canadian Journal of Occupational Therapy. 1996;63(1):9-23

16. Layton, N., Murphy, C & Bell, D. (2018) From individual innovation to global impact: the Global Co-operation on Assistive Technology (GATE) innovation snapshot as a method for sharing and scaling, Disability and Rehabilitation: Assistive Technology, 13:5, 486-491, DOI: 10.1080/17483107.2018.1467971
17. Molekoa, M.T., Ubisi, L., Sefotho, M. (2021). Full-service schoolteachers' views of career construction for learners with visual impairment. Int J Educ Vocat Guidance. https://doi.org/10.1007/s10775-021-09510-2
18. McLinden, M., Douglas, G., Cobb, R., Hewett, R., & Ravenscroft, J. (2016). 'Access to learning' and 'learning to access': Analysing the distinctive role of specialist teachers of children and young people with vision impairments in facilitating curriculum access through an ecological systems theory. British Journal of Visual Impairment, 34(2), 177–195. https://doi.org/10.1177/0264619616643180
19. Riemer-Reiss M.L. & Wacker, R.R. (2000) Factors associated with assistive technology discontinuance among individuals with disabilities. Journal of Rehabilitation. 2000;66(3):44-50.
20. Samuels, A., Stemela, U., & Booi, M. (2020). The intersection between Health and Education: meeting the intervention needs of children and youth with disabilities.
21. South African Health Review, 2020(1), 171-181.

22. Scherer, M. J. (2004). Connecting to learn: Educational and assistive technology for people with disabilities. American Psychological Association. https://doi.org/10.1037/10629-000

23. Smith, A. J., Geruschat, D., & Huebner, K. M. (2004). Policy to Practice: Teachers' and Administrators' Views on Curricular Access by Students with Low Vision. Journal of Visual Impairment & Blindness, 98(10), 612–628. https://doi.org/10.1177/0145482X0409801006

24. Thomas R, Barker L, Rubin G, Dahlmann-Noor A. (2015). Assistive technology for children and young people with low vision. Cochrane Database of Systematic Reviews 2015, Issue 6. Art. No.: CD011350. DOI: 10.1002/14651858.CD011350.pub2. Accessed 27 March 2023.

25. World Health Organization (2018) Assistive technology: World Health Assembly resolution on Improving access to assistive technology, Geneva: WHO https://www.who.int/en/news-room/fact-sheets/detail/assistive-technology [accessed 21 January 2021].

26. World Health Organisation. (2019). World report on vision. In World health Organization (Vol. 214, Issue 14). https://www.who.int/publications/i/item/worldreport-on-vision

27. World Health Organization. Regional Committee for Africa, 71. (2021). Framework for improving access to assistive technology in the WHO African Region: report of the Secretariat. World Health Organization. Regional Office for Africa. https://apps.who.int/iris/handle/10665/

28. World Health Organisation. (2021). Blindness and Visual Impairment: Key facts, 14 October 2021. Retrieved October 30, 2021. Available: https://www.who.int/newsroom/fact-sheets/detail/blindness-and-visual-impairment [Accessed July 15, 2022].

WEBSITES:

www.saddt.org.za

https://blindsa.org.za/2022/09/21/constitutional-court-judgment-on-copyright-act-amomentous-

victory-for-persons-who-are-blind-and-their-access-to-books/

http://www.treasury.gov.za/divisions/ocpo/ostb/contracts/default.aspx

GEO DIG – a sensory aid in a BUCKET

RECENTLY, I received a product to review called GEO DIG. It comprises a bucket, sand, 50 gemstones, small crytals, rough rocks and minerals; together with a gem stone identification card.

The developer, a seasoned educationist, believes the kit can provide children with a variety of sensory experiences that can help with their development. Sieving and washing the stones in water can improve fine motor skills and hand-eye co-ordination. The different textures, colours, and shapes of the stones can stimulate the senses and enhance cognitive development. Children can also practise sorting and organising the stones, which can improve their problem-solving and critical thinking skills.

For the elderly, the process of sieving and washing the stones can be a therapeutic and calming activity. This can be particularly beneficial for those who suffer from dementia or other cognitive impairments, as it can help them feel productive and engaged. The different colours and textures of the gems can also provide visual and tactile stimulation that can help improve their mood and cognitive function. Having real gem stones can stimulate reminiscence and ensures that the activity is not demeaning or childish.

The GEODIG Kit could be an ideal inter-generational activity and allow for connection and bonding. The process of working together to find, clean and identify the stones can be a fun and meaningful activity for both generations.

A review of the kit will be submitted to the August issue of Focus after trialling it at a memory care centre.

www.geodig.co.za

There will be a GEO DIG Bucket up for grabs for one lucky OT in a competiton to be announced in the August Focus. So watch this space!